Claims

1. A plasmid comprising a nucleotide sequence that encodes an immunogen operably linked to regulatory elements and a nucleotide sequence that encodes an immunomodulating protein operably linked to regulatory elements, wherein said immunomodulating protein is selected from the group consisting of: MCP-1, MIP-1α, MIP-1β, IL-8, RANTES, L-selectin, P-selectin, E-selectin, CD34, GlyCAM-1, MadCAM-1, LFA-1, VLA-1, Mac-1, p150.95, PECAM, ICAM-1, ICAM-2, ICAM-3, CD2, LFA-3, M-CSF, G-CSF, IL-4, mutant forms of IL-18, CD40, CD40L, vascular growth factor, IL-7, nerve growth factor, vascular endothelial growth factor, Fas, TNF receptor, Flt, Apo-1, p55, WSL-1, DR3, TRAMP, Apo-3, AIR, LARD, NGRF, DR4, DR5, KILLER, TRAIL-R2, TRICK2, DR6, and Caspase ICE.

2. The plasmid of claim 1 wherein said immunogen is a target protein that encodes a pathogen antigen, a cancer-associated antigen or an antigen linked to cells associated with autoimmune diseases.

3. The plasmid of claim 1 wherein said immunogen is a pathogen antigen.

4. The plasmid of claim 1 wherein said immunogen is an HIV-1 antigen.

5. The plasmid of claim 1 wherein said immunomodulating protein is ICAM-1 and further comprising a nucleotide sequence that encodes CD86 protein operably linked to regulatory elements.

6. An injectable pharmaceutical composition comprising the plasmid of claim 1.

7. A method of inducing an immune response in an individual against an immunogen comprising administering to said individual a plasmid of claim 1.

8. A plasmid comprising a nucleotide sequence that encodes a herpes simplex antigen operably linked to regulatory elements and a nucleotide sequence that encodes an

immunomodulating protein operably linked to regulatory elements, wherein said immunomodulating protein is selected from the group consisting of: IL-8, RANTES, LFA-3, and CD40L.

9. The plasmid of claim 1 wherein said herpes simplex antigen is HSV2gD.

10. An injectable pharmaceutical composition comprising the plasmid of claim 8.

11. A method of immunizing an individual against a herpes simplex virus infection comprising administering to said individual a plasmid of claim 8.

12. A composition comprising two plasmids:

a first plasmid comprising a nucleotide sequence that encodes an immunogen operably linked to regulatory elements; and

a second plasmid comprising a nucleotide sequence that encodes an immunomodulating protein operably linked to regulatory elements, wherein said immunomodulating protein is selected from the group consisting of: MCP-1, MIP-1α, MIP-1β, IL-8, RANTES, L-selectin, P-selectin, E-selectin, CD34, GlyCAM-1, MadCAM-1, LFA-1, VLA-1, Mac-1, p150.95, PECAM, ICAM-1, ICAM-2, ICAM-3, CD2, LFA-3, M-CSF, G-CSF, IL-4, mutant forms of IL-18, CD40, CD40L, vascular growth factor, IL-7, nerve growth factor, vascular endothelial growth factor, Fas, TNF receptor, Flt, Apo-1, p55, WSL-1, DR3, TRAMP, Apo-3, AIR, LARD, NGRF, DR4, DR5, KILLER, TRAIL-R2, TRICK2, DR6, and Caspase ICE.

13. The composition of claim 12 wherein said immunogen is a target protein that encodes a pathogen antigen, a cancer-associated antigen or an antigen linked to cells associated with autoimmune diseases.

14. The composition of claim 12 wherein said immunogen is a pathogen antigen.

15. The composition of claim 12 wherein said immunogen is an HIV-1 antigen.

16. The composition of claim 12 wherein said immunomodulating protein is ICAM-1 and further comprising a nucleotide sequence that encodes CD86 protein operably linked to regulatory elements, wherein said first plasmid, said second plasmid or a third plasmid comprises said nucleotide sequence that encodes CD86 protein.

17. An injectable pharmaceutical composition comprising the composition of claim 12.

18. A method of inducing an immune response in an individual against an immunogen comprising administering to said individual a composition of claim 12.

19. A composition comprising two plasmids:

a first plasmid comprising a nucleotide sequence that encodes a herpes simplex antigen operably linked to regulatory elements; and

a second plasmid comprising a nucleotide sequence that encodes IL-8, RANTES, LFA-3 or CD40L.

20. The composition of claim 19 wherein said herpes simplex antigen is HSV2gD.

21. An injectable pharmaceutical composition comprising the composition of claim 19.

22. A method of immunizing an individual against a herpes simplex virus infection comprising administering to said individual a plasmid of claim 19.

23. A recombinant vaccine comprising a nucleotide sequence that encodes an immunogen operably linked to regulatory elements and a nucleotide sequence that encodes an immunomodulating protein operably linked to regulatory elements, wherein said immunomodulating protein is selected from the group consisting of: MCP-1, MIP-1α, MIP-1β, IL-8, RANTES, L-selectin, P-selectin, E-selectin, CD34, GlyCAM-1, MadCAM-1, LFA-1, VLA-1, Mac-1, p150.95, PECAM, ICAM-1, ICAM-2, ICAM-3,

CD2, LFA-3, M-CSF, G-CSF, IL-4, mutant forms of IL-18, CD40, CD40L, vascular growth factor, IL-7, nerve growth factor, vascular endothelial growth factor, Fas, TNF receptor, Flt, Apo-1, p55, WSL-1, DR3, TRAMP, Apo-3, AIR, LARD, NGRF, DR4, DR5, KILLER, TRAIL-R2, TRICK2, DR6, and Caspase ICE.

24. The recombinant vaccine of claim 23 wherein said immunogen is a target protein that encodes a pathogen antigen, a cancer-associated antigen or an antigen linked to cells associated with autoimmune diseases.

25. The recombinant vaccine of claim 23 wherein said immunogen is a pathogen antigen.

26. The recombinant vaccine of claim 23 wherein said immunomodulating protein is ICAM-1 and further comprising a nucleotide sequence that encodes CD86 protein operably linked to regulatory elements.

27. A method of inducing an immune response in an individual against an immunogen comprising administering to said individual a recombinant vaccine of claim 1.

28. The recombinant vaccine of claim 23 wherein said recombinant vaccine is a recombinant vaccinia vaccine.

29. The recombinant vaccine of claim 23 wherein said immunogen is a pathogen antigen.

30. A method of inducing an immune response in an individual against an immunogen comprising administering to said individual a recombinant vaccine of claim 23.

31. A live attenuated pathogen comprising a nucleotide sequence that encodes immunomodulating protein operably linked to regulatory elements, wherein said immunomodulating protein is selected from the group consisting of: MCP-1, MIP-1α,

MIP-1β, IL-8, RANTES, L-selectin, P-selectin, E-selectin, CD34, GlyCAM-1, MadCAM-1, LFA-1, VLA-1, Mac-1, p150.95, PECAM, ICAM-1, ICAM-2, ICAM-3, CD2, LFA-3, M-CSF, G-CSF, IL-4, mutant forms of IL-18, CD40, CD40L, vascular growth factor, IL-7, nerve growth factor, vascular endothelial growth factor, Fas, TNF receptor, Flt, Apo-1, p55, WSL-1, DR3, TRAMP, Apo-3, AIR, LARD, NGRF, DR4, DR5, KILLER, TRAIL-R2, TRICK2, DR6, and Caspase ICE.

32. A method of immunizing an individual against a pathogen comprising administering to said individual the live attenuated pathogen of claim 31.

33. A method of inducing an immune response in an individual against an immunogen comprising administering to said individual:

said immunogen and/or a nucleic acid molecule comprising a nucleotide sequence that encodes said immunogen operably linked to regulatory elements; and

an immunomodulating protein and/or a nucleic acid molecule comprising a nucleotide sequence that encodes said immunomodulating protein operably linked to regulatory elements, wherein said immunomodulating protein is selected from the group consisting of: MCP-1, MIP-1α, MIP-1β, IL-8, RANTES, L-selectin, P-selectin, E-selectin, CD34, GlyCAM-1, MadCAM-1, LFA-1, VLA-1, Mac-1, p150.95, PECAM, ICAM-1, ICAM-2, ICAM-3, CD2, LFA-3, M-CSF, G-CSF, IL-4, mutant forms of IL-18, CD40, CD40L, vascular growth factor, IL-7, nerve growth factor, vascular endothelial growth factor, Fas, TNF receptor, Flt, Apo-1, p55, WSL-1, DR3, TRAMP, Apo-3, AIR, LARD, NGRF, DR4, DR5, KILLER, TRAIL-R2, TRICK2, DR6, and Caspase ICE.

34. The method of claim 33 wherein said immunogen is a target protein that encodes a pathogen antigen, a cancer-associated antigen or an antigen linked to cells associated with autoimmune diseases.

35. The method of claim 33 wherein said immunogen is a pathogen antigen.

36. The method of claim 33 wherein said immunogen is an HIV-1 antigen.

37. The method of claim 33 wherein said immunomodulating protein is ICAM-1 and said method further comprises administering CD86 protein or a nucleotide sequence that encodes CD86 protein operably linked to regulatory elements.

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38. An injectable pharmaceutical composition comprising a therapeutically effective amount of an antibody which specifically binds to an immunomodulating protein is selected from the group consisting of: MCP-1, MIP-1α, MIP-1β, IL-8, RANTES, L-selectin, P-selectin, E-selectin, CD34, GlyCAM-1, MadCAM-1, LFA-1, VLA-1, Mac-1, p150.95, PECAM, ICAM-1, ICAM-2, ICAM-3, CD2, LFA-3, M-CSF, G-CSF, IL-4, mutant forms of IL-18, CD40, CD40L, vascular growth factor, IL-7, nerve growth factor, vascular endothelial growth factor, Fas, TNF receptor, Flt, Apo-1, p55, WSL-1, DR3, TRAMP, Apo-3, AIR, LARD, NGRF, DR4, DR5, KILLER, TRAIL-R2, TRICK2, DR6, and Caspase ICE.

39. A method of treating an individual who has an autoimmune disease comprising the step of administering to said individual an injectable pharmaceutical composition according to claim 38.